

WHAT IS CLAIMED IS:

1. A method of modulating growth and cell proliferation in a plant, the method comprising modulating *ANT* activity; and selecting plants with altered cell number.
- 5 2. The method of claim 1, wherein the modulated cell proliferation is associated with altered plant size, mass or fertility; and the method comprises the step of selecting plants with altered size, mass or fertility.
- 10 3. The method of claim 1, wherein the *ANT* activity is increased and the method comprises the step of selecting plants with increased cell number.
4. The method of claim 3, wherein size or mass of a plant organ is increased.
5. The method of claim 3, wherein fertility is decreased.
6. The method of claim 3, wherein the step of increasing *ANT* activity includes the step of increasing *ANT* expression.
- 15 7. The method of claim 3, wherein increasing *ANT* expression comprises introducing into the plant an expression cassette containing a plant promoter operably linked to a heterologous *ANT* nucleic acid.
8. The method of claim 7, wherein the *ANT* nucleic acid is at least 20 50% identical to SEQ ID NO:1.
9. The method of claim 8, wherein the *ANT* nucleic acid is SEQ ID NO:1.
10. The method of claim 7, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:2.

11. The method of claim 10, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:2.
12. The method of claim 7, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:4.
- 5 13. The method of claim 12, wherein the *ANT* nucleic acid is SEQ ID NO:4.
14. The method of claim 7, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:5.
- 10 15. The method of claim 14, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:5.
16. The method of claim 3, wherein the ANT activity is increased in a shoot vegetative organ.
17. The method of claim 3, wherein the ANT activity is increased in a root.
- 15 18. The method of claim 3, wherein the ANT activity is increased in a floral organ.
19. The method of claim 3, wherein the ANT activity is increased in an ovule.
20. The method of claim 3, wherein the ANT activity is increased in a somatic embryo.
21. The method of claim 3, wherein the ANT activity is increased in a seed.
22. The method of claim 3, wherein the ANT activity is increased in a fruit.

23. The method of claim 1, wherein the ANT activity is decreased and the method comprises the step of selecting plants of decreased cell number.

24. The method of claim 23, wherein the step of decreasing ANT activity includes the step of decreasing *ANT* expression.

5 25. The method of claim 24, wherein decreasing *ANT* expression comprises introducing into the plant an expression cassette containing a plant promoter operably linked to a heterologous *ANT* nucleic acid.

26. The method of claim 25, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:1.

10 27. The method of claim 26, wherein the *ANT* nucleic acid is SEQ ID NO:1.

28. The method of claim 25 wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:2.

15 29. The method of claim 28 wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:2.

30. The method of claim 25, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:4.

31. The method of claim 30, wherein the *ANT* nucleic acid is SEQ ID NO:4.

20 32. The method of claim 25, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:5.

33. The method of claim 32, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:5.

25 34. The method of claim 23, wherein the ANT activity is decreased in a shoot vegetative organ.

35. The method of claim 23, wherein the ANT activity is decreased in a root.
36. The method of claim 23, wherein the ANT activity is decreased in a floral organ.
- 5 37. The method of claim 23, wherein the ANT activity is decreased in a seed.
38. The method of claim 23, wherein the ANT activity is decreased in a somatic embryo.
- 10 39. The method of claim 23, wherein the ANT activity is decreased in a fruit.
40. The method of claim 7 or 25, wherein the plant promoter is a constitutive promoter.
41. The method of claim 7 or 25, wherein the plant promoter is an inducible promoter.
- 15 42. The method of claim 7 or 25, wherein the plant promoter is a tissue specific promoter.
43. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in a shoot vegetative organ and the method includes the step of selecting plants with altered shoot vegetative organ size or mass.
- 20 44. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in a root and the method includes the step of selecting plants with altered root size or mass.
45. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in floral organs and the method includes the step of selecting plants that are sterile, or with altered floral organ size or mass.

46. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in ovules and the method includes the step of selecting plants that are female sterile, or with altered ovule size or mass.

5 47. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in anthers and the method includes the step of selecting plants that are male sterile, with altered anther size or mass, or with anthers that do not dehisce.

48. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in seeds and the method includes the step of selecting plants with altered seed size or mass.

10 49. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in somatic embryos.

50. The method of claim 42, wherein the promoter directs expression of the *ANT* nucleic acid in fruits and the method includes the step of selecting plants with altered fruit size or mass.

15 51. The method of claim 7 or 25, wherein the plant promoter is from an *ANT* gene.

52. The method of claim 51, wherein the promoter is as shown in SEQ ID NO: 3.

20 53. The method of claim 3, wherein the cell proliferation is associated with asexual reproduction.

54. The method of claim 53, wherein the step of increasing ANT activity includes the step of increasing *ANT* expression.

25 55. The method of claim 53, wherein increasing *ANT* expression comprises introducing into the plant an expression cassette containing a plant promoter operably linked to a heterologous *ANT* nucleic acid.

56. The method of claim 55, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:1.

57. The method of claim 56, wherein the *ANT* nucleic acid is SEQ ID NO:1.

5 58. The method of claim 55, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:2.

59. The method of claim 58, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:2.

10 60. The method of claim 55, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:4.

61. The method of claim 60, wherein the *ANT* nucleic acid is SEQ ID NO:4.

62. The method of claim 55, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:5.

15 63. The method of claim 62; wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:5.

64. The method of claim 53, wherein the plant arises in callus tissue.

65. The method of claim 64, wherein the plant arises from an adventitious shoot.

20 66. The method of claim 53, wherein the plant arises from a somatic embryo.

67. The method of claim 53, wherein the plant arises from a cutting.

68. The method of claim 3, wherein the method comprises selecting a plant with adventitious organs.

69. The method of claim 68, wherein the step of increasing ANT activity includes the step of increasing *ANT* expression.

70. The method of claim 69, wherein increasing *ANT* expression comprises introducing into the plant an expression cassette containing a plant promoter operably linked to a heterologous *ANT* nucleic acid.

71. The method of claim 69, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:1.

72. The method of claim 71, wherein the *ANT* nucleic acid is SEQ ID NO:1.

73. The method of claim 69, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:2.

74. The method of claim 73, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:2.

75. The method of claim 69, wherein the *ANT* nucleic acid is at least 50% identical to SEQ ID NO:4.

76. The method of claim 75, wherein the *ANT* nucleic acid is SEQ ID NO:4.

77. The method of claim 69, wherein the *ANT* nucleic acid encodes a polypeptide at least 60% identical to SEQ ID NO:5.

78. The method of claim 77, wherein the *ANT* nucleic acid encodes a polypeptide identical to SEQ ID NO:5.

79. The method of claim 68, wherein the plant arises in callus tissue.

80. A method of directing expression of a heterologous nucleic acid in a meristematic cell(s) of a plant, the method comprising introducing into the plant an

expression cassette containing an *ANT* promoter operably linked to a heterologous polynucleotide.

81. The method of claim 80, wherein the promoter is as shown in SEQ ID NO:3.

5 82. An isolated nucleic acid molecule comprising an *ANT* promoter sequence that is at least 80% identical to SEQ ID NO: 3.

83. The isolated nucleic acid molecule of claim 82, further comprising a heterologous polynucleotide operably linked to the *ANT* promoter sequence.

10 84. The isolated nucleic acid molecule of claim 82, wherein the *ANT* promoter sequence is as shown in SEQ ID NO:3.

85. An isolated nucleic acid molecule comprising an *ANT* nucleic acid sequence that is at least 50% identical to SEQ ID NO: 4, wherein the *ANT* nucleic acid sequence is not SEQ ID NO: 1.

15 86. The isolated nucleic acid molecule of claim 85, wherein the *ANT* nucleic acid sequence can be amplified by a primer having a sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:7 and SEQ ID NO:8.

87. The isolated nucleic acid molecule of claim 85, wherein the *ANT* nucleic acid sequence is as shown in SEQ ID NO: 4.

20 88. The isolated nucleic acid molecule of claim 85, wherein the *ANT* nucleic acid sequence encodes a polypeptide having a sequence at least about 90% identical to SEQ ID NO: 5 within the AP2 domains, or that having a sequence at least about 60% identical to SEQ ID NO: 5 in the entire region.

89. An isolated nucleic acid molecule comprising an *ANT* nucleic acid sequence that encodes a polypeptide as shown in SEQ ID NO: 5.